

The Knowledge Bank at The Ohio State University
Ohio State Engineer

Title: Back Matter

Issue Date: Apr-1923

Publisher: Ohio State University, College of Engineering

Citation: Ohio State Engineer, vol. 6, no. 3 (April, 1923), 32-36.

URI: <http://hdl.handle.net/1811/34206>

Appears in Collections: [Ohio State Engineer: Volume 6, no. 3 \(April, 1923\)](#)

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We have purchased 12,000 pair U. S. Army Munson last shoes, sizes 5½ to 12 which was the entire surplus stock of one of the largest U. S. Government shoe contractors.

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NOTICE

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THE OHIO STATE ENGINEER
117 Shops Bldg.,
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SHEETS

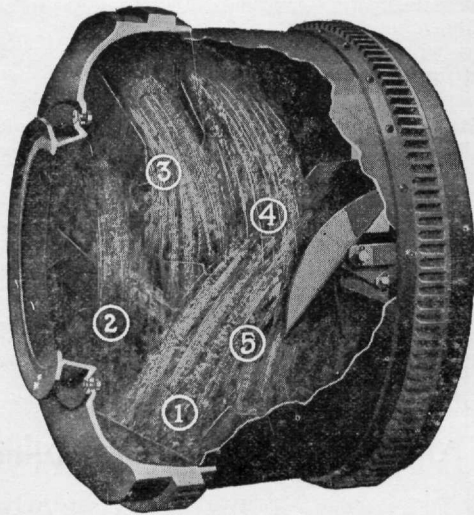
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GOODMAN BROTHERS JEWELERS

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What does *Koehring Dominant Strength Concrete* mean to the Contractor—Owner-Engineer?



(1) Blade cuts through materials with churning action. (2) Blade carries materials up, spilling down again against motion of drum. (3) Materials hurled across diameter of drum. (4) Materials elevated to drum top and cascaded down to reversed discharge chute which (5) with scattering, spraying action, showers materials back to charging side for repeated trips through mixing process.

TO the contractor, it means reduced surfacing costs because dominant strength concrete is plastic, flows into the forms readily, is easily worked, and gives a good surface.

To the owner, it insures a structure of good appearance — and of greatest inherent worth — To the engineer, it brings the assurance that the concrete will have the strength that he assumes in his design.

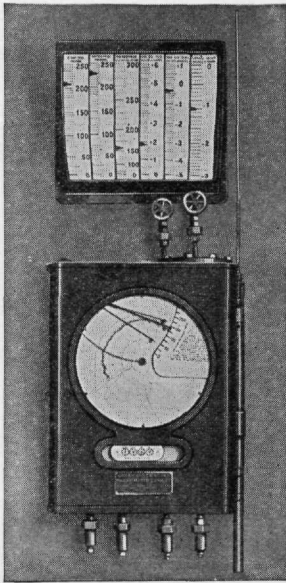
The Koehring Five-action Re-mixing Principle prevents separation of aggregate according to size—coats every particle of aggregate thoroughly with cement, and delivers uniform, plastic concrete to the last shovelful of every batch.



KOEHRING COMPANY
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BAILEY METERS



*BOILER PANEL consisting of
Bailey Multi-Pointer Gage, Type
P6F, and Bailey Boiler Meter,
Type D26, Class 59.*

BAILEY BOILER METERS are of real assistance in obtaining maximum efficiency and capacity from boiler operation because they record the rate of Steam Flow from the boiler, the rate of Air Flow through the furnace and the Flue Gas Temperature on a single uniformly graduated chart. The relation between the Steam Flow and Air Flow shows instantly whether an excess or a deficiency of air is being supplied. Stoker speed as well as the integrator for Steam Flow may be added.

BAILEY MULTI-POINTER GAGES are made with any number of pointers to fit each installation. Indicate Pressure, Temperature, Rate of Flow, Draft, Speed, etc.

BAILEY METERS FOR COAL AND GRANULAR MATERIALS measure coal, crushed ore and other granular materials in large quantities.

BAILEY FLUID METERS record and integrate the flow of steam or water at any pressure or temperature. The meters may be supplied with pressure recorders, temperature recorders or both.

BAILEY GAS METERS record and integrate the flow of low or high pressure gas or air at any temperature. Special meters built for measurement of chemically active gases.

BAILEY GRAVITY RECORDERS FOR LIQUIDS record the true specific gravity of a flowing sample on a 12 in. circular chart.

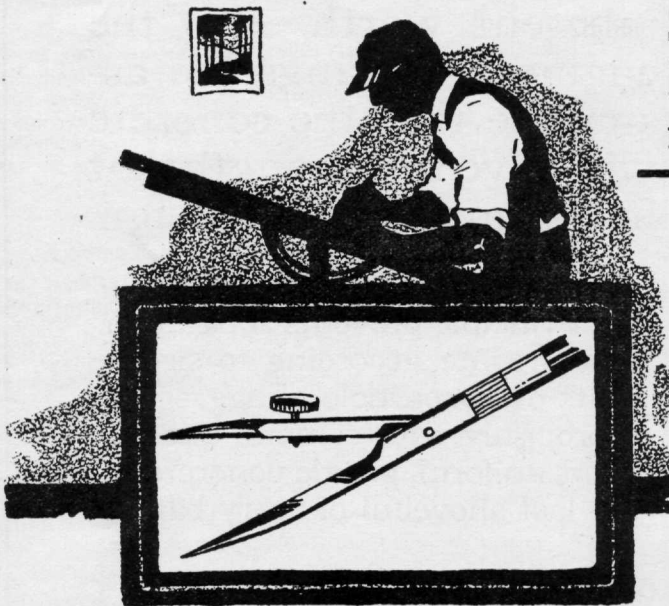
OTHER TYPES of Meters as well as recording and indicating Gages are made for different purposes, so that nearly any problem in connection with the metering of fluids can be handled.

Bulletins Sent on Request

Bailey Meter Company

2043 E. 46th St.

Cleveland, Ohio



Special Offer—A Guaranteed Pease Jack Knife Ruling Pen for \$2.85—Ten Day's Trial

So positive are we that this remarkable pen will please you that we will gladly send one to you on ten days' approval. Notice the ebony finish aluminum handle and the graduated thumb screw; and remember that the price is only \$2.85, or you can return the pen to us without any obligation.

The Pease Jack Knife Ruling Pen has a hinged upper blade which opens to a full 90 degrees as easily as a knife blade. It is the only pen of its kind that retains exactly the convenient form and shape of an ordinary ruling pen. There are no projections at the hinge which makes other hinged pens awkward to use.

Cleaned Without Touching the Set Screw

Rapid accurate ruling can be done with the Pease Jack Knife Ruling Pen because the blade opens easily for cleaning without touching the set screw. Thus the adjustment for width of line is preserved and cleaning is made convenient and simple.

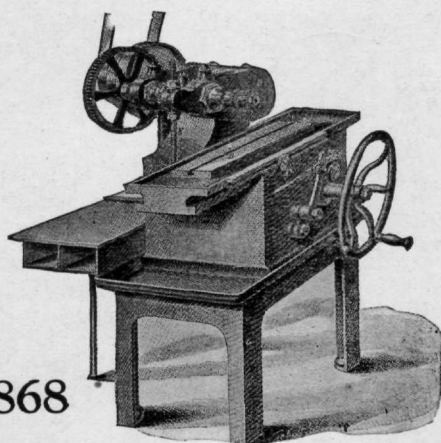
Just clip out this advertisement and attach it to your letterhead and we will immediately send you a guaranteed Pease Jack Knife Ruling Pen at special price of \$2.85. You may return it within ten days if it is not entirely satisfactory.



THE C. F. PEASE COMPANY

836 N. Franklin St., Chicago, Ill.

Blue Printing Machinery—Drafting Room Supplies—Drawing Instruments



1868

Elbow Grease and the Touch of a Finger

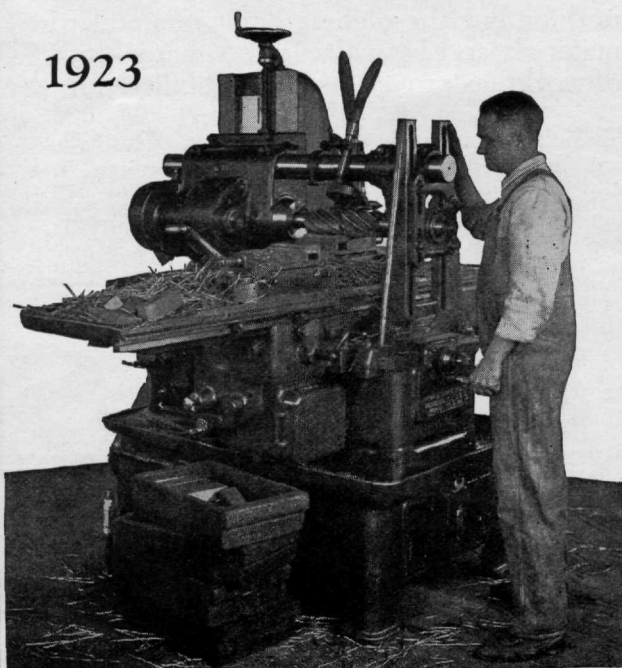
THE plain milling machine of 1868 was a vast improvement over the file and cold chisel as a means of shaping metal. Yet the old machine required husky arms and a strong back to work the hand feed of the table through the long hours of the day.

The Brown & Sharpe Automatic Milling Machine of 1923 starts with the touch of a finger and the table will feed back and forth continuously as long as desired. The spindle will start, stop or reverse automatically and the entire machine is designed for the rapid production of duplicate parts.

In addition to this machine, we build a complete line of milling machines which is listed in our No. 137 Catalog, a copy of which will be sent on request together with special literature on this No. 33 Automatic Milling Machine.

BROWN & SHARPE MFG. CO.
Providence, R. I., U. S. A.

1923



GOOD LIGHTING OF INDUSTRIAL PLANTS SECURES SAFETY AND EFFICIENCY.

The Code of Lighting for factories, mills and other work places of the State of New Jersey makes excellent recommendations of daylight for the proper lighting of industrial buildings.

Adequate daylight facilities through large window areas, together with light, cheerful surroundings, are highly desirable and necessary features in every work place, and they should be supplied through the necessary channels, not only from the humane standpoint, but also from the viewpoint of maximum plant efficiency.

Importance of Daylight.

The unusual attention to gas and electric lighting in factories, mills and other work places during the past few years; the perfection of various lamps and auxiliaries, by means of which an improved quality and quantity of lighting effects are obtained; and the care which has been devoted to increasing the efficiency in various industrial apparatus—all go to emphasize the many advantages and economies that result from vital and adequate window space, as a means for daylight in the proper quantities, and in the right direction during those portions of the day when it is available.

Three Considerations.

Three important considerations of any lighting method are sufficiency, continuity and diffusion, with respect to the daylight illumination of interiors. Sufficiency demands adequate window area; continuity requires (a) large enough window area for use on reasonably dark days, (b) means for reducing the illumination when excessive, due to direct sunshine, and supplementing lighting equipment for use on particularly dark days, and especially towards the close of winter days, (c) diffusion demands interior decorations that are as light in color as practicable for ceilings and upper portions of walls, and of a dull or matt finish, in order that the light which enters the windows or that which is produced by lamps may not be absorbed and lost on the first object that it strikes; but that it may be returned by reflection and thus be used over and over again.

Diffusion also requires that the various sources of light, whether windows, skylights or lamps, be well distributed about the space to be lighted. Light colored surroundings as here suggested result in marked economy, but their main object is perhaps not so much economy as to obtain results that will be satisfactory to the human eye.

Requirements for natural lighting:

1. The light should be adequate for each employee.
2. The windows should be so spaced and located that daylight is fairly uniform over the working area.
3. The intensities of daylight should be such that artificial light will be required only during those portions of the day when it would naturally be considered necessary.
4. The windows should provide a quality of daylight which will avoid a glare, due to the sun's rays, and light from the sky shining directly into the eye, or where this does not prove to be the case at all parts of the day, window shades or other means should be available to make this end possible.

As will be noticed in the above recommendations, large windows and proper diffusion of daylight are urged, in order to meet the demands of daylight lighting.

Shades may be eliminated and most efficient lighting obtained by the use of Factrolite Glass.

If interested in the distribution of light through Factrolite, we will send you a copy of Laboratory Report—"Factrolited."

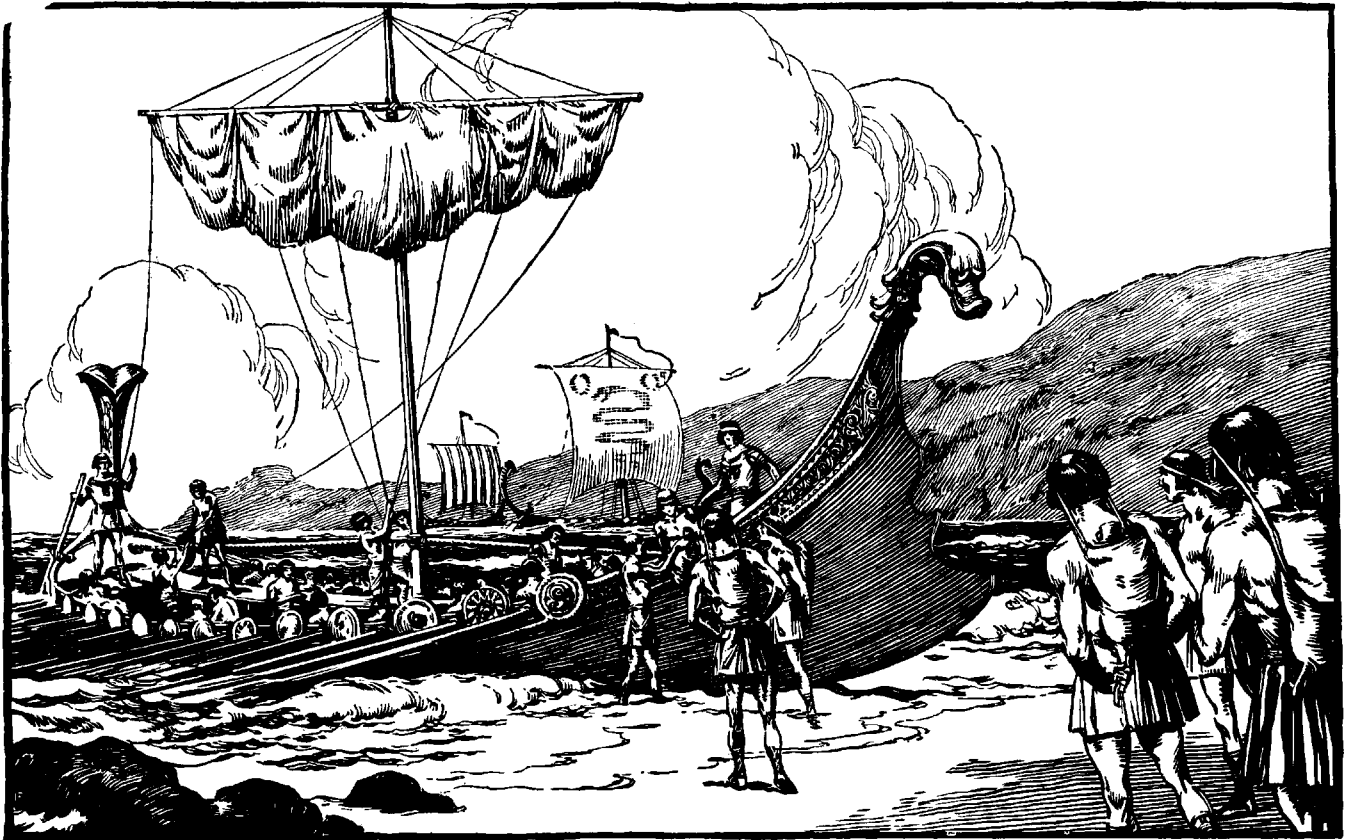
MISSISSIPPI WIRE GLASS CO.,

220 Fifth Avenue,

St. Louis.

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Chicago.



Silver for Hiram of Tyre

Hiram of Tyre was the metal king of the world in the tenth century, B. C. From Spain, his fleet brought back every third year the entire production of what is now the Rio Tinto Mine.

Three tons of silver a year was all that 40,000 workmen could produce in Hiram's time. In a recent year, at the same mine, 9,000 men, with the aid of explosives, mined $2\frac{1}{2}$ million tons of ore. From this ore, almost 30,000 tons of copper alone was obtained.

But the cost of time and labor are so much higher now than when King Hiram worked the Rio Tinto that even dynamite, as great a labor saver as it is, must be scientifically selected and used.

On work for which it is suited Hercules Special No. 1 is more economical than the usual grades of dynamite. It contains about one-third more cartridges per case than 40% dynamite which it often replaces, cartridge for cartridge; at a saving of about twenty-five percent in blasting costs. It contains nothing but the highest grade of standard materials and by wide use on many kinds of work has proved its dependability.

To help you in using explosives most effectively, we have prepared a series of practical booklets. If you have not yet received them, write to our Advertising Department, 939 King Street, Wilmington, Del., for free copies of "Eliminating Waste in Blasting", "Scientific Quarry Blasting", and "Hercules Products".

HERCULES

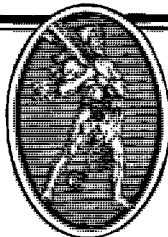
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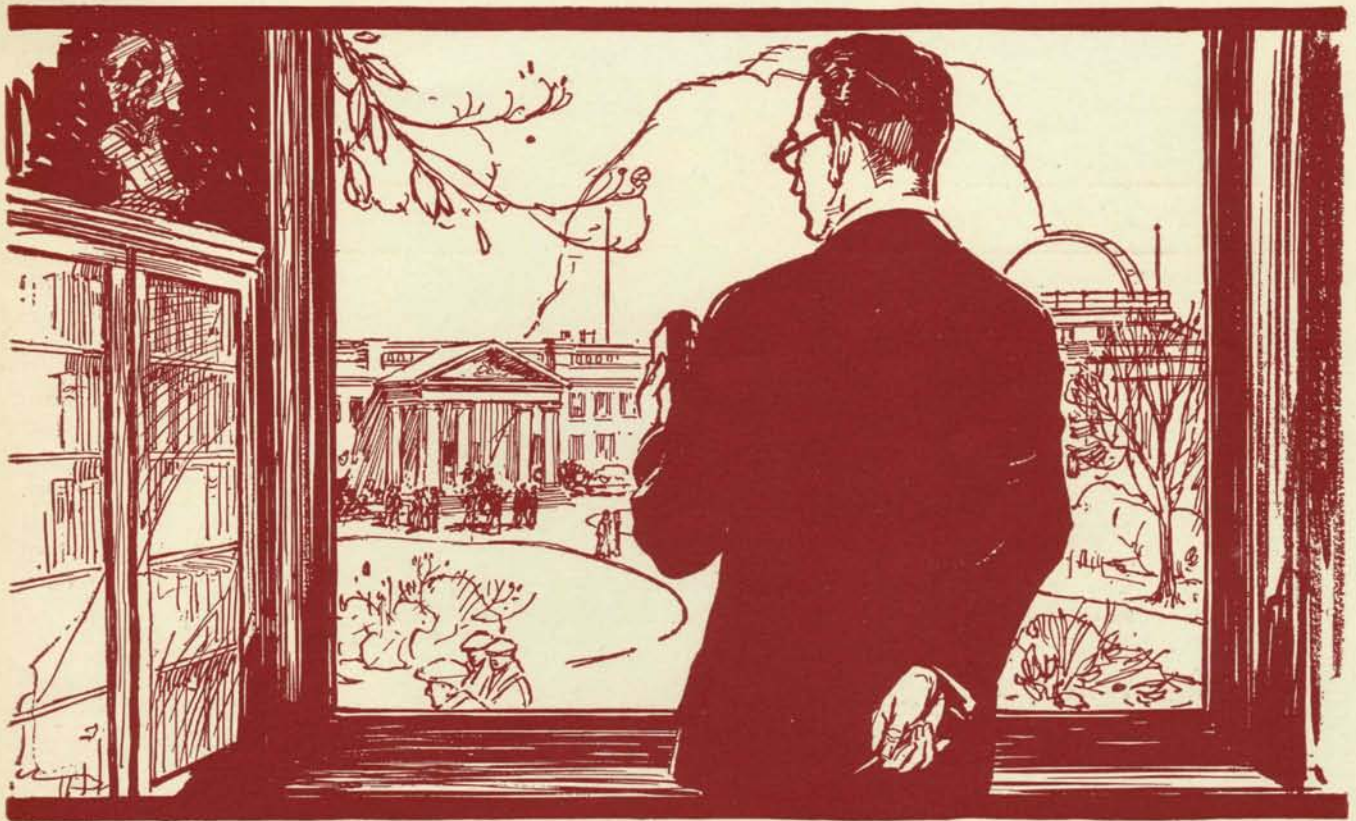
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San Francisco, Calif.
Wilkesbarre, Pa.
Wilmington, Del.



Teaching Engineering—a Real Man's Work

"Why are you satisfied to spend your days here when you might be doing bigger and more remunerative work with us?" The speaker was the Vice President of a big corporation, and he was addressing a great chemist.

The man to whom he spoke looked from his study window out over a well-loved campus for several moments before he replied. Finally his answer came, "I guess it's because I am more interested in helping to make *men* than I would be in just making *things*."

This thing of building men is one of the most fascinating vocations known. The pleasure that grows out of watching men develop, out of seeing them make effective use of the fundamentals that have been so carefully given them to use—it is doubtful if there can be any pleasure much deeper or more satisfying.

The teacher honors himself in the usefulness of his students. And the teacher of engineering, especially. His laboratory and his materials are in the minds of men. He shows them the right and constructive use of the senses and the memory in securing and storing information. He trains the judgment and the will to analyze and to decide. Little by little he develops the will to do, the ability to turn decision into accomplishment, the quality that always marks the successful engineer, who is a man who gets things done.

Westinghouse, and every engineering business, must acknowledge a deep obligation to those teachers whose training and interest have been an inspiration and a sure foundation for the individual successes that are constantly being recorded. And nothing that men or events may do can deprive the teacher of his rightful share of such triumphs!

Westinghouse

ACHIEVEMENT & OPPORTUNITY



VOLTA EXPLAINING HIS



BATTERY TO NAPOLEON

How Electrical Engineering began

IT IS not enough to experiment and to observe in scientific research. There must also be interpretation. Take the cases of Galvani and Volta.

One day in 1786 Galvani touched with his metal instruments the nerves of a frog's amputated hind legs. The legs twitched in a very life-like way. Even when the frog's legs were hung from an iron railing by copper hooks, the phenomenon persisted. Galvani knew that he was dealing with electricity but concluded that the frog's legs had in some way generated the current.

Then came Volta, a contemporary, who said in effect: "Your interpretation is wrong. Two different metals in contact with a moist nerve set up currents of electricity. I will prove it without the aid of frog's legs."

Volta piled disks of different metals one on top of another and

separated the disks with moist pieces of cloth. Thus he generated a steady current. This was the "Voltaic pile"—the first battery, the first generator of electricity.

Both Galvani and Volta were careful experimenters, but Volta's correct interpretation of effects gave us electrical engineering.

Napoleon was the outstanding figure in the days of Galvani and Volta. He too possessed an active interest in science but only as an aid to Napoleon. He little imagined on examining Volta's crude battery that its effect on later civilization would be fully as profound as that of his own dynamic personality.

The effects of the work of Galvani and Volta may be traced through a hundred years of electrical development even to the latest discoveries made in the Research Laboratories of the General Electric Company.

General  Electric
General Office Company Schenectady, N.Y.